

A Landscape–Scale Model to Predict the Upper Extent of Fish Habitat

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Regulations intended to provide protection of aquatic resources in Washington State distinguish between fish habitat and no fish habitat waters. The Forest and Fish Report prescribed a new system that relies on a GIS-based model to determine fish habitat classification. The model is field data driven, and is intended to provide high classification accuracy and balance between economic and aquatic resource considerations. Available field survey data collected at the upper limit of fish habitat across western Washington was used to develop and assess a preliminary model. Stream characterization data was derived from USGS Digital Elevation Models, and included drainage area, stream gradient, elevation, and precipitation. A logistic regression model incorporated these variables to assign a likelihood of fish habitat presence within streams. A heuristic rule further refined the model prediction to a single break point. Due to the non-random nature of the available survey data, model precision, accuracy and balance across western Washington could not be reliably characterized. Largest model errors were usually associated with natural barriers, headwater lakes, or stream reaches with intermediate model probability. Opportunities exist for use the model as a screen to identify areas with highest likelihood of error.

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